

## CLAIMS

What is claimed is:

- Sub a2
- 1 1. A method, comprising activating a node of a computer network such that the node  
2 first attempts to establish contact with other nodes that may exist within the computer  
3 network and, if unsuccessful in doing so, then establishes itself as a single node  
4 network.
- 1 2. ~~The method of claim 1 wherein the node first attempts to establish contact with the~~  
2 ~~other nodes by cycling through a set of one or more common channels for~~  
3 ~~communication within the computer network, at each channel attempting to establish~~  
4 ~~contact by transmitting a request packet thereon.~~
- 1 3. ~~The method of claim 2 wherein after transmitting a request packet on one of the~~  
2 ~~common channels, the node listens for a response packet before proceeding to a next~~  
3 ~~one of the common channels.~~
- Sub a3
- 1 4. ~~The method of claim 2 wherein the one or more common channels are wireless~~  
2 ~~communication channels.~~
- 1 5. ~~The method of claim 3 wherein upon receiving a response packet from one of the~~  
2 ~~other nodes, the node enters a synchronization mode and joins the computer network.~~
- Sub a4
- 1 6. ~~The method of claim 5 wherein the response packet includes a parameter specifying~~  
2 ~~time within the computer network.~~

1 7. ~~The method of claim 5 wherein the response packet further includes a code~~  
2 identifying the network.

1 8. ~~The method of claim 7 wherein the code identifying the network is first included in~~  
2 ~~the request packet.~~

1 9. The method of claim 1 wherein while the node is established as a single node  
2 network, the node listens for attempts by further nodes to join a network.

1 10. The method of claim 9 wherein upon detecting one or more attempts by the further  
2 nodes to join a network, the node transmits a response thereto.

1 11. The method of claim 10 wherein the response includes an indication of time within  
2 the single node network.

1 12. The method of claim 11 wherein the response further includes a network code.

1 13. A method, comprising:  
2 receiving, at a first node of a computer network, an indication of time within  
3 the computer network according to a second node of the computer network; and  
4 determining whether to adjust the time at the first node according to whether  
5 the indication of time received from the second node is younger or older than the time  
6 at the first node.

1 14. ~~The method of claim 13 wherein the time at the first node is only adjusted if the~~  
2 ~~indication of time received from the second node is older than the time at the first~~  
3 ~~node.~~

1 15. The method of claim 14 wherein the indication of time received from the second node  
2 is augmented for delays within the computer network before determining whether to  
3 adjust time at the first node.

1 *Sub* 16. The method of claim 15 wherein if the indication of time received from the second  
2 node differs from the time at the first node by more than a predetermined threshold  
3 amount, the first node determines whether the first node or the second node has  
4 *C* priority over the other and adjusts the time at the first node only if the second node  
5 has priority.

1 17. The method of claim 16 wherein the first node first transmits a Transition Request  
2 packet before adjusting the time at the first node.

1 18. The method of claim 17 wherein nodes synchronized with the first node receive the  
2 Transition Request packet from the first node and adjust corresponding local times  
3 according to a time specified in the Transition Request packet.

*Sub*  
*a6* 19. A method, comprising computing a transmission time for a packet from a first node of  
2 a computer network according to the identification of the node and the age of the  
3 network.

1 20. The method of claim 19 wherein the age of the network comprises an indication of  
2 the network age up to the start of a current frame within which the packet is to be  
3 transmitted.

*Sub*  
*a7* 21. The method of claim 20 wherein the packet comprises a network control packet.

1 22. ~~The method of claim 20 wherein the computing is performed using a function that~~  
2 provides a varying distribution of results for varying inputs of the identification of the  
3 first node and the age of the network, the results ranging from a minimum to a  
4 maximum representing a number of transmission slots per frame within which the  
5 ~~control packet may be transmitted.~~

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1 23. ~~The method of claim 22 wherein the function comprises an encryption function.~~

1 24. ~~The method of claim 22 wherein the function comprises a hash function.~~

1 25. ~~The method of claim 24 wherein the hash function comprises the MD5 hash function.~~

Sub 23  
1 26. ~~The method of claim 20 wherein the computing is performed using a table of entries~~  
2 ~~of pseudorandom values.~~

1 27. ~~The method of claim 26 wherein the pseudorandom values represent transmission~~  
2 ~~slots within the frame within which the control packet may be transmitted.~~

Sub 24  
1 28. ~~The method of claim 20 further comprising computing, at the first node, transmission~~  
2 ~~times for other nodes of the computer network.~~

1 29. ~~The method of claim 28 wherein computing transmission times for the other nodes is~~  
2 ~~performed using unique identifiers for each of the other nodes and the network age.~~

1 30. ~~The method of claim 29 wherein computing transmission times for the other nodes is~~  
2 ~~accomplished using a function that is also used for computing the transmission time~~  
3 ~~for the first node.~~

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- 1 31. The method of claim 30 wherein the other nodes are all within a two-hop  
2 neighborhood of the first node in the computer network.
- 1 32. The method of claim 31 wherein the first node resolves contentions for transmission  
2 times between itself and any of the other nodes according to a priority determination.
- 1 33. The method of claim 32 wherein the priority determination is ~~made using a function~~  
2 ~~that provides a unique output for varying identification and network age inputs.~~
- 1 34. The method of claim 33 wherein the function comprises an encryption algorithm.
- 1 35. The method of claim 33 wherein the function comprises a table look-up.
- 1 36. The method of claim 33 wherein the priority determination is further made using a  
2 priority bias associated with each of the nodes.
- 1 37. The method of claim 36 wherein the first node transmits at the transmission time if it  
2 is determined to have priority over the other nodes.
- 1 38. The method of claim 37 wherein the first node transmits at the transmission time if it  
2 further has priority exceeding a priority threshold.
- 1 39. The method of claim 33 wherein the first node transmits at the transmission time if it  
2 is determined to have priority over the other nodes.
- 1 40. The method of claim 39 wherein the first node transmits at the transmission time if it  
2 further has priority exceeding a priority threshold.

1 41. The method of claim 21 wherein the control packet advertises a schedule for a data  
2 transmission.

1 42. The method of claim 41 wherein the schedule includes an identification of one or  
2 more nodes to receive the data transmission.

1 43. The method of claim 42 wherein the schedule further includes a data transmission  
2 time.

1 44. The method of claim 43 wherein the schedule further includes a data transmission  
2 channel.

1 45. The method of claim 41 wherein the schedule includes a persistence indicator.

1 46. The method of claim 42 wherein the nodes to receive the data transmission are  
2 identified by local identifiers being smaller than network identifiers associated with  
3 the nodes.

1 47. The method of claim 46 wherein the first node transmits a mapping of the local  
2 identifiers to the network identifiers within the network.

1 48. The method of claim 41 wherein the control packet includes acknowledgement  
2 information to schedules transmitted by one or more other nodes of the network.

1 49. The method of claim 32 wherein the priority determination is made using a table of  
2 pseudorandom values.

1 50. The method of claim 49 wherein the table of pseudorandom values is indexed by a  
2 value derived from a media access control layer address of the first node to retrieve an  
3 entry corresponding to a first priority determination.

1 51. The method of claim 50 wherein the first priority determination is checked by  
2 logically combining the media access control layer address of the first node with the  
3 entry corresponding to the first priority determination to resolve conflicts.

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1 52. A method, comprising using a topology-independent scheduling procedure to  
2 determine candidate packet transmission times within a computer network for the  
3 transmission of packets therein and a topology-dependent scheduling procedure to  
4 avoid collisions in contended time periods.

1 ~~53. The method of claim 52 wherein the topology-independent scheduling procedure~~  
2 ~~utilizes an age of the network and unique identifiers for each node of the network to~~  
3 ~~determine the candidate transmission times for each of the nodes.~~

1 54. The method of claim ~~53~~ wherein the topology-independent scheduling procedure  
2 computes the candidate transmission times for each of the nodes using a function that  
3 ~~provides a varying distribution of outputs for a varying sampling of inputs.~~

1 55. The method of claim 54 wherein the function comprises at least one of a hash  
2 function, an encryption function or a table look-up operation.

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- 1 56. The method of claim 54 wherein conflicts for the candidate transmission times for  
2 each of the nodes are resolved according to a priority associated with each of the  
3 nodes.
- 1 57. The method of claim 56 wherein the priority for each of the nodes is determined  
2 according to a function that provides a unique output for each set of inputs.
- 1 58. The method of claim 57 wherein the function that provides a unique output for each  
2 set of inputs comprises at least one of an encryption function, a hash function or a  
3 table look-up operation.
- 1 59. The method of claim 57 wherein the inputs to the function that provides a unique  
2 output for each set of inputs comprise one or more of a unique identifier associated  
3 with each node, a scheduling frame number for the network, and a priority bias for  
4 each node.

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